AMENDMENTS TO THE CLAIMS

1-17. (Cancelled)

18. (Previously Presented) A multi-joint drive mechanism comprising:

a flat-plate bone-member layer member in which a plurality of flat plate bone members are arranged in arrays, each of the flat plate bone members having at least one recessed portion, the plurality of bone members being movably coupled at coupling portions, the coupling portions comprising flat plates; and

elastic members which are arranged so as to stretch over the coupling portions on at least one of a contact-surface side of the bone-member layer member that is to make contact with an object and a noncontact-surface side of the bone-member layer member opposed to the contact-surface side, the elastic members being fitted into the recessed portions of adjacent ones of the bone members so as to be fixed to the adjacent ones of the bone members, the elastic members being capable of being elastically expanded and contracted,

wherein the multi-joint drive mechanism is operable to drive flexural motions with the coupling portions between adjoining bone members serving as joints by expanding or contracting the elastic members, and the multi-joint drive mechanism has a layer structure in which at least the flat-plate bone-member layer member and the elastic members are arranged in a planar fashion.

19. (Previously Presented) The multi-joint drive mechanism as claimed in claim 18, wherein a degree of freedom of the coupling portions is given generally only by a degree of rotational freedom and the degree of freedom of the coupling portions at least of proximities of their forward ends is restrained to one degree of freedom about an axis generally perpendicular to a direction of the arrays of the bone-member layer member.

20. (Previously Presented) The multi-joint drive mechanism as claimed in claim 19, wherein the coupling portions are constructed by hinges each formed of a flat spring.

21. (Withdrawn) The multi-joint drive mechanism as claimed in claim 19, wherein the

coupling portions are hinges formed of the bone members themselves by constricting a part of the bone members.

22. (Previously Presented) The multi-joint drive mechanism as claimed in claim 18, wherein a flexible wiring board having signal lines for connection of deformation sensors for detecting a deformation amount of the coupling portions, and drive lines for electrically driving the elastic members is disposed in proximities to flexural portions of the coupling portions.

23. (Withdrawn) The multi-joint drive mechanism as claimed in claim 22, wherein the flexible wiring board serves also as hinges each formed of a flat spring.

24. (Previously Presented) The multi-joint drive mechanism as claimed in claim 18, further comprising a device for expanding or contracting the elastic members, the device being a device which is driven with air pressure applied to a rubber elastic member or a device which is driven by heating and cooling shape-memory material or a device which is driven with an electric field applied to an electro-active polymer.

25. (Withdrawn) The multi-joint drive mechanism as claimed in claim 24, wherein the elastic members are each formed of a rubber elastic member, and the device for expanding or contracting the elastic members is a device for performing drive by application of air pressure to the rubber elastic members, the multi-joint drive mechanism further comprising a multilayer-type pneumatic piping layer member having piping for applying air pressure to the rubber elastic members.

26. (Cancelled)

27. (Withdrawn) A grasping hand having a plurality of finger mechanisms provided in opposition to each other, each of the finger mechanisms having a multi-joint drive mechanism which includes

a flat-plate bone-member layer member in which a plurality of flat plate bone members are arranged in arrays, each of the flat plate bone members having at least one recessed portion, the plurality of bone members being movably coupled at coupling portions, the coupling portions comprising flat plates, and

elastic members which are arranged so as to stretch over the coupling portions on at least one of a contact-surface side of the bone-member layer member that is to make contact with an object and a noncontact-surface side of the bone-member layer member opposed to the contact-surface side, the elastic members being fitted into the recessed portions of adjacent ones of the bone members so as to be fixed to the adjacent ones of the bone members, the elastic members being capable of being elastically expanded and contracted, wherein the multi-joint drive mechanism is operable to drive flexural motions with the coupling portions between adjoining bone members serving as joints by expanding or contracting the elastic members, and the multi-joint drive mechanism has a layer structure in which at least the flat-plate bone-member layer member and the elastic members are arranged in a planar fashion,

and wherein the grasping hand is operable to perform a grasping operation for the object by expanding or contracting the elastic members to drive the finger mechanisms.

28. (Withdrawn) The grasping hand as claimed in claim 27, wherein the grasping hand is enabled to grasp the object by the plurality of finger mechanisms provided in opposition to each other and has, at least on a grasping surface side of the grasping hand, touch sensors, or displacement sensors for the coupling portions, or tag information detection antennas, wherein grasping operation is controlled based on information detected by the touch sensors, displacement sensors or antennas.

29. (Withdrawn) The grasping hand as claimed in claim 27, wherein at least a part of a grasping surface side of the grasping hand is covered with a high-friction soft material.

30. (Withdrawn) The grasping hand as claimed in claim 27, wherein the elastic members are provided on an outer side-face side of the grasping hand, the elastic members include both expansion type and contraction type ones so as to drive the grasping operation by

antagonistic action of both types.

31. (Cancelled)

32. (Withdrawn) A robot comprising:

a grasping hand having a plurality of multi-joint drive mechanisms, each of the multi-joint drive mechanisms having

a flat-plate bone-member layer member in which a plurality of flat plate bone members are arranged in arrays, each of the flat plate bone members having at least one recessed portion, the plurality of bone members being movably coupled at coupling portions, the coupling portions comprising flat plates, and

elastic members which are arranged so as to stretch over the coupling portions on at least one of a contact-surface side of the bone-member layer member that is to make contact with an object and a noncontact-surface side of the bone-member layer member opposed to the contact-surface side, the elastic members being fitted into the recessed portions of adjacent ones of the bone members so as to be fixed to the adjacent ones of the bone members, the elastic members being capable of being elastically expanded and contracted, wherein each of the multi-joint drive mechanisms is operable to drive flexural motions with the coupling portions between adjoining bone members serving as joints by expanding or contracting the elastic members, and has a layer structure in which at least the flat-plate bone-member layer member and the elastic members are arranged in a planar fashion; and

a touch sensor, or a displacement sensor for the coupling portions provided on the grasping hand, whereby a grasping operation of the grasping hand is controlled based on information detected by the touch sensor or the displacement sensor.

33. (Withdrawn) The robot as claimed in claim 32, further comprising a grasping-object information detection device, wherein the grasping-object information detection device is one of an ultrasonic type or image pick-up type or a grasping object detection sensor or camera or a tag information detection antenna, whereby the grasping operation of the grasping hand is planned and controlled based on grasping-object information detected by the grasping-object

information detection device.

34. (Withdrawn) The multi-joint drive mechanism as claimed in claim 18, wherein the bone-member layer member has the plurality of bone members arranged in arrays and in a generally planar fashion.

35. (Withdrawn) The grasping hand as claimed in claim 28, wherein the touch sensors are pressure sensitive sensors or friction sensors.

36. (Withdrawn) The grasping hand as claimed in claim 29, wherein at least a part of the grasping surface side of the grasping hand is covered with rubber.

37. (Withdrawn) The robot as claimed in claim 32, wherein the touch sensor is a pressure-sensitive sensor or a friction sensor.

38. (New) The multi-joint drive mechanism as claimed in claim 18, further comprising:

a plurality of drive sources, wherein each of the drive sources is arranged to drive flexural motions of a corresponding one of the elastic members by expanding or contracting the corresponding one of the elastic members.

39. (Withdrawn – New) The grasping hand as claimed in claim 27, wherein the multi-joint drive mechanism further comprises:

a plurality of drive sources, wherein each of the drive sources is arranged to drive flexural motions of a corresponding one of the elastic members by expanding or contracting the corresponding one of the elastic members.

40. (Withdrawn – New) The robot as claimed in claim 32, wherein each of the multi-joint drive mechanisms includes a plurality of drive sources, each of the drive sources being arranged to drive flexural motions of a corresponding one of the elastic members by expanding or contracting the corresponding one of the elastic members.